

## Comment on **essd-2021-411**

Anonymous Referee #1

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Referee comment on "A data-driven topsoil  $\delta^{13}\text{C}$  dataset and the drivers of spatial variability across the Tibetan Plateau" by Yunsen Lai et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-411-RC1>, 2022

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The manuscript "A data-driven topsoil  $\delta^{13}\text{C}$  dataset and the drivers of spatial variability across the Tibetan Plateau" is well written, and the language is good. Although the quality of the presentation is excellent, I do not recommend its publication for the following reasons:

- The manuscript's scientific relevance (environmental science, earth science) is not obvious for me. The spatial distribution of soil organic carbon  $\delta^{13}\text{C}$  in the upper 3 cm layer of soils is not significant, since it does not represent soil organic matter in any way.
- The data on which the communication is based are dubious, in my opinion.

Critical comments:

- Data source (2.1). The paper is based on two sources: the first dataset by Lu et al. 2004; and the second dataset by Qi 2017. I have not found any dataset under the second source. I also found uncertainties in the first source. Authors reported sampling from 0 - 5 cm, while Lu et al. reported about 0-3 cm. I also have severe doubts about the applicability of the dataset since:

- It is impossible to completely remove organic debris from the 0-3 cm soil layer for many soil types. Consequently, the data quality is dubious.

- I could not find any information on the carbonate content of the soils in the area in the manuscript. Lu et al. reported on the treatment of their samples with 1N HCl. This treatment removes (an unknown) part of the SOM from both carbonate and carbonate-

free soils. Consequently, the data quality is dubious.

- Sampling is limited to the valleys. However, no information is available on the geomorphological position of the sampling points. The geomorphological position (as an environmental variable) is critical! This can be a more important factor than the vegetation.

Data analysis (2.3). The authors applied one-way ANOVA. This is a good technique, but this is a kind of parametric test. This test can only be used if the dataset has a normal distribution. The authors have not mentioned testing this.